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PATENT SPECIFICATION

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(54) CAMERA SUITABLE FOR USE WITH A FLASH APPARATUS

(71) We, AGFA—GEVAERT AKTIENGESELLSCHAFT, a body corporate recognised under German law, of Leverkusen, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a camera having means for striking an ignition device to operate a flash apparatus.

It is an object of the invention to construct a camera of the type outlined above which will allow reliable operation of the flash apparatus in a simple manner and at little cost.

The invention provides a camera, suitable for use with flash apparatus, which includes means for striking a flash ignition device which is contained in the camera or in a flash apparatus attached to the camera, the striker means including a striker member, first resilient means arranged when tensioned to tend to urge the striker member towards the ignition device when attached, a tensioning member arranged during movement from a first position to a second position to tension the first resilient means and during movement from the second position to the first position to urge the striker member out of engagement with the ignition device, second resilient means tending to urge the tensioning member from the second position to the first position and drive means for driving the tensioning member from the first position to the second position to tension the first resilient means, and there is provided first releasable locking means arranged, when engaged, to retain the striker member out of engagement with the ignition device and second releasable locking means arranged to retain the tensioning member in the second position, the second locking means being arranged to disengage the tensioning member at the end

of movement of the striker member towards the ignition device.

Advantageously, the tensioning member is pivotally mounted and the arrangement is such that when the tensioning member is pivoted in one sense, the first resilient means is tensioned, and when the tensioning member is pivoted in the other sense, it is arranged to move the striker member out of contact with the ignition device. Preferably, the striker member is arranged to release the second locking means at the end of a striking operation so that the tensioning member is urged out of the second position by the second resilient means.

Advantageously, the second locking means comprises a resiliently mounted pawl and the tensioning member has an extension, the extension and the pawl being so shaped that the extension slides over the pawl during pivoting of the tensioning member from the first position to the second position but is prevented from sliding over the pawl during pivoting of the tensioning member from the second position to the first position. Preferably, the striker member has an extension which is arranged to engage the pawl, at the end of a striking operation, to release the tensioning member.

Advantageously, there is provided a projection on the tensioning member which engages the first resilient means and is arranged to slide in a slot in the striker member and to engage the end of the slot to bring the striker out of contact with the ignition device during the pivoting of the tensioning member out of the second position.

Advantageously, the first locking means comprises a pivotally mounted locking member, the first locking member being arranged to engage the extension on the striker member to prevent pivoting of the striker member towards the ignition device when attached, the arrangement being such that when the first locking member is

pivoted in one sense, the striker member is released to actuate the ignition device, there being provided further resilient means tending to pivot the first locking member in the other sense. Preferably, the first locking member is arranged to engage the striker member after the striker member has been pivoted out of contact with the ignition device under the action of the second resilient means. This allows the striker member to be automatically readied for a further striking operation.

Advantageously, the drive means comprises a member, coupled to the film transport means, which is arranged to engage the tensioning member to drive it from the first position to the second position so that the first resilient means is tensioned during the film transport operation, or the drive means may comprise a member arranged to engage the tensioning member and so coupled to shutter release means that the first resilient means is tensioned by the shutter release means before the shutter is released.

Advantageously, the striker member is so coupled to the shutter release means that the shutter is released by the striker member during a striking operation.

In an advantageous manner the striker member is arranged to release further striker means for striking an ignition device which is contained in the flash apparatus, the further striker means being fitted into the flash apparatus in a tensioned position.

The ignition device may be a piezo-electric device which when struck delivers a high voltage pulse to fire the flash apparatus or the ignition device may be a percussive primer element.

One form of camera constructed in accordance with the invention will now be described, with reference to the accompanying drawing, which is a view of the parts of the camera and flash apparatus relating to the striker means.

Referring to the accompanying drawing, a striker lever 2 is pivotably arranged about a spindle 3 in a camera housing 1. The lever 2 has at its free end a striker member 4 which can pivot through an aperture 5 in the camera housing 1. Fitted onto the camera is a percussive flash-cube 6, which can be pivoted by members 7 provided in the camera, during film transport. Primer elements 8 are provided with each flash bulb of the flash-cube 6 each of which brings about the ignition of its associated flash-bulb when struck by the striker member 4.

As previously proposed, however, it is also feasible for further striker members, which are retained under tension to be provided in the flash-cube 6. These mem-

bers can then be released by means of the striker member 4 to run down and actuate a primer element 8.

The striker lever 2 is held in its initial position by a release lever 9, engaging on extension 11 on the striker lever 2, the release lever being pivotable about a spindle 10. The striker lever 2 also has a slot-like aperture 12, through which protrudes a pin 13 of a tensioning member 14. The tensioning member 14 is also pivotable about the spindle 3, and has a return spring 15. The striker lever 2 and the tensioning member 14 are yoked together by a spring 16, one end of which engages with a pin 17 on the striker lever 2.

The tensioning member 14 is provided with a first extension 18 with which engages a resiliently mounted pawl 19. A second extension 20 of the tensioning member 14 projects into the path of movement of a lug 21 of a tensioning slider 22.

The release lever 9 has a release arm 23 which is in contact with a control membrane 24. A spring 25 engages with the release lever 9.

The method of operation is as follows: Before the camera release operation, all the parts are in the positions shown in the drawing. If the membrane 24 is actuated in the direction of the arrow A, the release lever 9 is pivoted in the direction of the arrow B by way of the arm 23. After release of the extension 11 of the striker lever 2 by the release lever 9, the striker lever 2 pivots the striker member 4, under the action of the spring 16, through the aperture 5 in the camera housing 1 towards the primer element 8. The ignition of the flash-bulb, which is ready-for-use, then takes place.

At the end of movement of the striker lever 2 towards the primer element 8 the extension 11 pivots the retaining pawl 19 out of engagement with the extension 18, of the tensioning member 14, with the result that the tensioning member 14 moves in the direction of the arrow C under the influence of the return spring 15. The tensioning member 14 pivots the striker lever 2 by means of the pin 13 in the direction of the arrow C. By means of an oblique surface 26 provided on the extension 11, the release lever 9 is pivoted in the direction of the arrow B. The extension 11 then engages behind the extension 27 of the release lever 9.

During the film transport operation which now occurs, the flash-cube 6 is pivoted through 90° in a manner which is not shown. At the same time, the slider 22 is moved in the direction of the arrow D. By means of the extension 21 on the slider 22, the tensioning member 14 is pivoted by way of the

extension 20 in the opposite direction to the arrow C and against the action of the spring 15. After a certain travel of the slider 22 the extension 18 of the tensioning member 14 locks behind the retaining pawl 19. The slider 22 is then returned to its initial position in a manner which is not shown and all parts are then in the positions shown in the drawing.

WHAT WE CLAIM IS:—

1. A camera which includes means for striking a flash ignition device which is contained in the camera or in a flash apparatus attached to the camera, the striker means including a striker member, first resilient means arranged when tensioned to tend to urge the striker member towards the ignition device when attached, a tensioning member arranged during movement from a first position to a second position to tension the first resilient means and during movement from the second position to the first position to urge the striker member out of engagement with the ignition device, second resilient means tending to urge the tensioning member from the second position to the first position and drive means for driving the tensioning member from the first position to the second position to tension the first resilient means, and there is provided first releasable locking means arranged, when engaged, to retain the striker member out of engagement with the ignition device and second releasable locking means arranged to retain the tensioning member in the second position, the second locking means being arranged to disengage the tensioning member at the end of movement of the striker member towards the ignition device.
2. A camera as claimed in claim 1, wherein the tensioning member is pivotally mounted, and the arrangement is such that, when the tensioning member is pivoted in one sense, the first resilient means is tensioned, and when the tensioning member is pivoted in the other sense, it is arranged to move the striker member out of contact with the ignition device.
3. A camera as claimed in claim 1 or 2, wherein the striker member is arranged to release the second locking means at the end of a striking operation so that the tensioning member is urged from the second position by the second resilient means.
4. A camera as claimed in any one of claims 1 to 3 wherein the second locking means comprises a resiliently mounted pawl and the tensioning member has an extension, the extension and the pawl being so shaped that the extension slides over the pawl during pivoting of the tensioning member from the first position to the second position but is prevented from sliding over the pawl during pivoting of the tensioning

member from the second position to the first position.

5. A camera as claimed in claim 4 when dependent on claim 3, wherein the striker member has an extension which is arranged to engage the pawl at the end of a striking operation, to release the tensioning member.

6. A camera as claimed in any one of claims 1 to 5, wherein there is provided a projection on the tensioning member which engages the first resilient means and is arranged to slide in a slot in the striker member and to engage the end of the slot to bring the striker member out of contact with the ignition device during the pivoting of the tensioning member out of the second position.

7. A camera as claimed in claim 5 wherein the first locking means comprises a pivotally mounted member, the first locking member being arranged to engage the extension on the striker member to prevent pivoting of the striker member towards the ignition device when attached, the arrangement being such that, when the first locking member is pivoted in one sense the striker member is released to actuate the ignition device, there being provided further resilient means tending to pivot the first locking member in the other sense.

8. A camera as claimed in claim 7, wherein the first locking member is arranged to engage the striker member after the striker member has been pivoted out of contact with the ignition device under the action of the second resilient means.

9. A camera as claimed in any one of claims 1 to 8, wherein the drive means comprises a member coupled to the film transport means, which is arranged to engage the tensioning member to drive it from the first position to the second position so that the first resilient means is tensioned during the film transport operation.

10. A camera as claimed in any one of claims 1 to 8, where in the drive means comprises a member arranged to engage the tensioning member and so coupled to the shutter release means that the first resilient means is tensioned by the shutter release means before the shutter is released.

11. A camera as claimed in any one of claims 7 to 10 wherein there is provided a flexible membrane release for the locking means.

12. A camera as claimed in any one of claims 1 to 9 or claim 11 when dependent on any one of claims 7 to 9, wherein the striker member is so coupled to the shutter release means that the shutter is released by the striker member during a striking operation.

13. A camera as claimed in any one of claims 1 to 12, wherein the striker member is arranged to release further striker means for



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extension 20 in the opposite direction to the arrow C and against the action of the spring 15. After a certain travel of the slider 22 the extension 18 of the tensioning member 14

locks behind the retaining pawl 19. The slider 22 is then returned to its initial position in a manner which is not shown and all parts are then in the positions shown in the drawing.

WHAT WE CLAIM IS:—

1. A camera which includes means for striking a flash ignition device which is contained in the camera or in a flash apparatus attached to the camera, the striker means including a striker member, first resilient means arranged when tensioned to tend to urge the striker member towards the ignition device when attached, a tensioning member arranged during movement from a first position to a second position to tension the first resilient means and during movement from the second position to the first position to urge the striker member out of engagement with the ignition device, second resilient means tending to urge the tensioning member from the second position to the first position and drive means for driving the tensioning member from the first position to the second position to tension the first resilient means, and there is provided first releasable locking means arranged, when engaged, to retain the striker member out of engagement with the ignition device and second releasable locking means arranged to retain the tensioning member in the second position, the second locking means being arranged to disengage the tensioning member at the end of movement of the striker member towards the ignition device.

2. A camera as claimed in claim 1, wherein the tensioning member is pivotally mounted, and the arrangement is such that, when the tensioning member is pivoted in one sense, the first resilient means is tensioned, and when the tensioning member is pivoted in the other sense, it is arranged to move the striker member out of contact with the ignition device.

3. A camera as claimed in claim 1 or 2, wherein the striker member is arranged to release the second locking means at the end of a striking operation so that the tensioning member is urged from the second position by the second resilient means.

4. A camera as claimed in any one of claims 1 to 3 wherein the second locking means comprises a resiliently mounted pawl and the tensioning member has an extension, the extension and the pawl being so shaped that the extension slides over the pawl during pivoting of the tensioning member from the first position to the second position but is prevented from sliding over the pawl during pivoting of the tensioning

member from the second position to the first position.

5. A camera as claimed in claim 4 when dependent on claim 3, wherein the striker member has an extension which is arranged to engage the pawl at the end of a striking operation, to release the tensioning member.

6. A camera as claimed in any one of claims 1 to 5, wherein there is provided a projection on the tensioning member which engages the first resilient means and is arranged to slide in a slot in the striker member and to engage the end of the slot to bring the striker member out of contact with the ignition device during the pivoting of the tensioning member out of the second position.

7. A camera as claimed in claim 5 wherein the first locking means comprises a pivotally mounted member, the first locking member being arranged to engage the extension on the striker member to prevent pivoting of the striker member towards the ignition device when attached, the arrangement being such that, when the first locking member is pivoted in one sense the striker member is released to actuate the ignition device, there being provided further resilient means tending to pivot the first locking member in the other sense.

8. A camera as claimed in claim 7, wherein the first locking member is arranged to engage the striker member after the striker member has been pivoted out of contact with the ignition device under the action of the second resilient means.

9. A camera as claimed in any one of claims 1 to 8, wherein the drive means comprises a member coupled to the film transport means, which is arranged to engage the tensioning member to drive it from the first position to the second position so that the first resilient means is tensioned during the film transport operation.

10. A camera as claimed in any one of claims 1 to 8, where in the drive means comprises a member arranged to engage the tensioning member and so coupled to the shutter release means that the first resilient means is tensioned by the shutter release means before the shutter is released.

11. A camera as claimed in any one of claims 7 to 10 wherein there is provided a flexible membrane release for the locking means.

12. A camera as claimed in any one of claims 1 to 9 or claim 11 when dependent on any one of claims 7 to 9, wherein the striker member is so coupled to the shutter release means that the shutter is released by the striker member during a striking operation.

13. A camera as claimed in any one of claims 1 to 12, wherein the striker member is arranged to release further striker means for

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striking an ignition device which is contained in the flash apparatus, the further striker means being fitted into the flash apparatus in a tensioned position.

5 14. A camera as claimed in any one of claims 1 to 13, wherein the ignition device comprises a piezo-electric device.

15. A camera as claimed in any one of claims 1 to 13, wherein the ignition device

comprises percussive primer element.

16. A camera substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

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